

API-03-03-PCT-US SeqList-61510.ST25  
SEQUENCE LISTING

<110> Berinstein, Neil  
Gallichan, Scott  
Lovitt, Corey  
Parrington, Mark  
Pedyczak, Artur  
Radvanyi, Laszlo  
Singh-Sandhu, Devender

<120> Tumor Antigens BFA5 for Prevention and/or Treatment of  
Cancer

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<140> US 10/553,137

<141> 2004-04-15

<150> PCT/IB2004/001701

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<150> US 60/462,945

<151> 2003-04-15

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<170> PatentIn version 3.2

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Page 6

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825

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Val Thr Phe Leu Val Asp Arg Lys Cys Gln Leu Asp Val Leu Asp Gly
35 40 45

Glu His Arg Thr Pro Leu Met Lys Ala Leu Gln Cys His Gln Glu Ala
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Cys Ala Asn Ile Leu Ile Asp Ser Gly Ala Asp Ile Asn Leu Val Asp  
65 70 75 80

Val Tyr Gly Asn Met Ala Leu His Tyr Ala Val Tyr Ser Glu Ile Leu  
85 90 95

Ser Val Val Ala Lys Leu Leu Ser His Gly Ala Val Ile Glu Val His  
100 105 110

Asn Lys Ala Ser Leu Thr Pro Leu Leu Leu Ser Ile Thr Lys Arg Ser  
115 120 125

Glu Gln Ile Val Glu Phe Leu Leu Ile Lys Asn Ala Asn Ala Asn Ala  
130 135 140

Val Asn Lys Tyr Lys Cys Thr Ala Leu Met Leu Ala Val Cys His Gly  
145 150 155 160

Ser Ser Glu Ile Val Gly Met Leu Leu Gln Gln Asn Val Asp Val Phe  
165 170 175

Ala Ala Asp Ile Cys Gly Val Thr Ala Glu His Tyr Ala Val Thr Cys  
180 185 190

Gly Phe His His Ile His Glu Gln Ile Met Glu Tyr Ile Arg Lys Leu  
195 200 205

Ser Lys Asn His Gln Asn Thr Asn Pro Glu Gly Thr Ser Ala Gly Thr  
210 215 220

Pro Asp Glu Ala Ala Pro Leu Ala Glu Arg Thr Pro Asp Thr Ala Glu  
225 230 235 240

Ser Leu Val Glu Lys Thr Pro Asp Glu Ala Ala Pro Leu Val Glu Arg  
245 250 255

Thr Pro Asp Thr Ala Glu Ser Leu Val Glu Lys Thr Pro Asp Glu Ala  
260 265 270

Ala Ser Leu Val Glu Gly Thr Ser Asp Lys Ile Gln Cys Leu Glu Lys  
275 280 285

Ala Thr Ser Gly Lys Phe Glu Gln Ser Ala Glu Glu Thr Pro Arg Glu  
290 295 300

Ile Thr Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp Pro Ala  
 305 310 315 320  
 Lys Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Asp Thr Pro  
 325 330 335  
 Arg Glu Ile Met Ser Pro Ala Lys Glu Thr Ser Glu Lys Phe Thr Trp  
 340 345 350  
 Ala Ala Lys Gly Arg Pro Arg Lys Ile Ala Trp Glu Lys Lys Glu Thr  
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 Pro Val Lys Thr Gly Cys Val Ala Arg Val Thr Ser Asn Lys Thr Lys  
 370 375 380  
 Val Leu Glu Lys Gly Arg Ser Lys Met Ile Ala Cys Pro Thr Lys Glu  
 385 390 395 400  
 Ser Ser Thr Lys Ala Ser Ala Asn Asp Gln Arg Phe Pro Ser Glu Ser  
 405 410 415  
 Lys Gln Glu Glu Asp Glu Glu Tyr Ser Cys Asp Ser Arg Ser Leu Phe  
 420 425 430  
 Glu Ser Ser Ala Lys Ile Gln Val Cys Ile Pro Glu Ser Ile Tyr Gln  
 435 440 445  
 Lys Val Met Glu Ile Asn Arg Glu Val Glu Glu Pro Pro Lys Lys Pro  
 450 455 460  
 Ser Ala Phe Lys Pro Ala Ile Glu Met Gln Asn Ser Val Pro Asn Lys  
 465 470 475 480  
 Ala Phe Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Pro Met Phe  
 485 490 495  
 Pro Pro Glu Ser Lys Gln Lys Asp Tyr Glu Glu Asn Ser Trp Asp Ser  
 500 505 510  
 Glu Ser Leu Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys  
 515 520 525  
 Ala Thr His Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu  
 530 535 540  
 Ser Pro Asn Lys Asp Gly Leu Leu Lys Ala Thr Cys Gly Met Lys Val  
 545 550 555 560

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Ser Ile Pro Thr Lys Ala Leu Glu Leu Lys Asp Met Gln Thr Phe Lys  
 565 570 575  
 Ala Glu Pro Pro Gly Lys Pro Ser Ala Phe Glu Pro Ala Thr Glu Met  
 580 585 590  
 Gln Lys Ser Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr  
 595 600 605  
 Trp Arg Ala Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr  
 610 615 620  
 Glu Glu Asn Ser Trp Asp Thr Glu Ser Leu Cys Glu Thr Val Ser Gln  
 625 630 635 640  
 Lys Asp Val Cys Leu Pro Lys Ala Ala His Gln Lys Glu Ile Asp Lys  
 645 650 655  
 Ile Asn Gly Lys Leu Glu Gly Ser Pro Val Lys Asp Gly Leu Leu Lys  
 660 665 670  
 Ala Asn Cys Gly Met Lys Val Ser Ile Pro Thr Lys Ala Leu Glu Leu  
 675 680 685  
 Met Asp Met Gln Thr Phe Lys Ala Glu Pro Pro Glu Lys Pro Ser Ala  
 690 695 700  
 Phe Glu Pro Ala Ile Glu Met Gln Lys Ser Val Pro Asn Lys Ala Leu  
 705 710 715 720  
 Glu Leu Lys Asn Glu Gln Thr Leu Arg Ala Asp Glu Ile Leu Pro Ser  
 725 730 735  
 Glu Ser Lys Gln Lys Asp Tyr Glu Glu Ser Ser Trp Asp Ser Glu Ser  
 740 745 750  
 Leu Cys Glu Thr Val Ser Gln Lys Asp Val Cys Leu Pro Lys Ala Thr  
 755 760 765  
 His Gln Lys Glu Ile Asp Lys Ile Asn Gly Lys Leu Glu Glu Ser Pro  
 770 775 780  
 Asp Asn Asp Gly Phe Leu Lys Ala Pro Cys Arg Met Lys Val Ser Ile  
 785 790 795 800  
 Pro Thr Lys Ala Leu Glu Leu Met Asp Met Gln Thr Phe Lys Ala Glu  
 805 810 815



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Pro Pro Glu Lys Pro Ser Ala Phe Glu Pro Ala Ile Glu Met Gln Lys  
820 825 830

Ser Val Pro Asn Lys Ala Leu Glu Leu Lys Asn Glu Gln Thr Leu Arg  
835 840 845

Ala Asp Gln Met Phe Pro Ser Glu Ser Lys Gln Lys Lys Val Glu Glu  
850 855 860

Asn Ser Trp Asp Ser Glu Ser Leu Arg Glu Thr Val Ser Gln Lys Asp  
865 870 875 880

Val Cys Val Pro Lys Ala Thr His Gln Lys Glu Met Asp Lys Ile Ser  
885 890 895

Gly Lys Leu Glu Asp Ser Thr Ser Leu Ser Lys Ile Leu Asp Thr Val  
900 905 910

His Ser Cys Glu Arg Ala Arg Glu Leu Gln Lys Asp His Cys Glu Gln  
915 920 925

Arg Thr Gly Lys Met Glu Gln Met Lys Lys Lys Phe Cys Val Leu Lys  
930 935 940

Lys Lys Leu Ser Glu Ala Lys Glu Ile Lys Ser Gln Leu Glu Asn Gln  
945 950 955 960

Lys Val Lys Trp Glu Gln Glu Leu Cys Ser Val Arg Leu Thr Leu Asn  
965 970 975

Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile Leu Asn Glu Lys Ile  
980 985 990

Arg Glu Glu Leu Gly Arg Ile Glu Glu Gln His Arg Lys Glu Leu Glu  
995 1000 1005

Val Lys Gln Gln Leu Glu Gln Ala Leu Arg Ile Gln Asp Ile Glu  
1010 1015 1020

Leu Lys Ser Val Glu Ser Asn Leu Asn Gln Val Ser His Thr His  
1025 1030 1035

Glu Asn Glu Asn Tyr Leu Leu His Glu Asn Cys Met Leu Lys Lys  
1040 1045 1050

Glu Ile Ala Met Leu Lys Leu Glu Ile Ala Thr Leu Lys His Gln



Ile Thr Ile Asp Ile His Phe Leu Glu Arg Lys Met Gln His His  
 1295 1300 1305

Leu Leu Lys Glu Lys Asn Glu Glu Ile Phe Asn Tyr Asn Asn His  
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Glu Asn Ser  
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Ser Ile Pro Thr Lys Ala Leu Glu Leu  
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Leu Glu Leu Lys Asn Glu Gln Thr Leu  
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Thr Val Ser Gln Lys Asp Val Cys Leu  
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&lt;400&gt; 12

Ser Val Pro Asn Lys Ala Leu Glu Leu  
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&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 13

Cys Glu Thr Val Ser Gln Lys Asp Val  
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&lt;211&gt; 9

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&lt;213&gt; Homo sapiens

&lt;400&gt; 14

Lys Ile Asn Gly Lys Leu Glu Glu Ser  
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&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 15

Ser Leu Val Glu Lys Thr Pro Asp Glu  
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Ser Leu Cys Glu Thr Val Ser Gln Lys  
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Glu Ile Asp Lys Ile Asn Gly Lys Leu  
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Met Leu Leu Gln Gln Asn Val Asp Val  
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Asn Met Trp Leu Gln Gln Gln Leu Val  
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Phe Leu Val Asp Arg Lys Cys Gln Leu  
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Tyr Leu Leu His Glu Asn Cys Met Leu  
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Ser Leu Phe Glu Ser Ser Ala Lys Ile

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Lys Ile Thr Ile Asp Ile His Phe Leu  
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Gln Leu Gln Ser Lys Asn Met Trp Leu  
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Ser Leu Asp Gln Lys Leu Phe Gln Leu  
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Phe Leu Leu Ile Lys Asn Ala Asn Ala  
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Lys Ile Leu Asp Thr Val His Ser Cys  
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Ser Leu Ser Lys Ile Leu Asp Thr Val  
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&lt;211&gt; 9

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&lt;400&gt; 29

Ile Leu Ile Asp Ser Gly Ala Asp Ile  
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Lys Val Met Glu Ile Asn Arg Glu Val  
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Lys Leu Leu Ser His Gly Ala Val Ile  
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Ala Val Tyr Ser Glu Ile Leu Ser Val  
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Ile Leu Ser Val Val Ala Lys Leu Leu  
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Val Leu Ile Ala Glu Asn Thr Met Leu  
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Lys Leu Ser Lys Asn His Gln Asn Thr  
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Ser Leu Thr Pro Leu Leu Leu Ser Ile  
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Ser Gln Tyr Ser Gly Gln Leu Lys Val  
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Lys Glu Leu Glu Val Lys Gln Gln Leu  
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Gln Ile Met Glu Tyr Ile Arg Lys Leu  
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Ala Met Leu Lys Leu Glu Ile Ala Thr  
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Val Leu His Gln Pro Leu Ser Glu Ala  
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Gly Leu Leu Lys Ala Thr Cys Gly Met  
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Cys Met Leu Lys Lys Glu Ile Ala Met  
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Glu Gln Met Lys Lys Lys Phe Cys Val  
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Ile Gln Lys Ile Glu Leu Lys Ser Val  
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Ser Val Pro Asn Lys Ala Phe Glu Leu  
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Ser Ile Tyr Gln Lys Val Met Glu Ile  
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Asn Leu Asn Tyr Ala Gly Asp Ala Leu  
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&lt;213&gt; Homo sapiens

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Ala Val Gln Asp His Asp Gln Ile Val  
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&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 53

Phe Glu Ser Ser Ala Lys Ile Gln Val  
 1 5

&lt;210&gt; 54

&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 54

Gly Val Thr Ala Glu His Tyr Ala Val  
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&lt;210&gt; 55

&lt;211&gt; 9

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&lt;213&gt; Homo sapiens

&lt;400&gt; 55

Arg Val Thr Ser Asn Lys Thr Lys Val  
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&lt;211&gt; 9

&lt;212&gt; PRT

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Thr Val Ser Gln Lys Asp Val Cys Val  
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Lys Ser Gln Glu Pro Ala Phe His Ile  
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Lys Val Leu Ile Ala Glu Asn Thr Met  
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Met Leu Lys Leu Glu Ile Ala Thr Leu  
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Met Leu Lys Lys Glu Ile Ala Met Leu  
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Leu Leu Lys Glu Lys Asn Glu Glu Ile  
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Ala Leu Arg Ile Gln Asp Ile Glu Leu  
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Lys Ile Arg Glu Glu Leu Gly Arg Ile  
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Thr Leu Lys Leu Lys Glu Glu Ser Leu  
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Ile Leu Asn Glu Lys Ile Arg Glu Glu  
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Val Leu Lys Lys Lys Leu Ser Glu Ala  
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Gly Thr Ser Asp Lys Ile Gln Cys Leu  
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Gly Ala Asp Ile Asn Leu Val Asp Val  
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Glu Leu Cys Ser Val Arg Leu Thr Leu  
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Ser Leu Lys Ile Asn Leu Asn Tyr Ala  
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Lys Thr Pro Asp Glu Ala Ala Ser Leu  
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Ala Thr Cys Gly Met Lys Val Ser Ile  
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Leu Ser His Gly Ala Val Ile Glu Val  
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Glu Ile Ala Met Leu Lys Leu Glu Ile  
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Ala Glu Leu Gln Met Thr Leu Lys Leu  
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Val Phe Ala Ala Asp Ile Cys Gly Val  
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Pro Ala Ile Glu Met Gln Asn Ser Val  
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Glu Ile Phe Asn Tyr Asn Asn His Leu  
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Gln Leu Val His Ala His Lys Lys Ala  
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Asn Ile Gln Asp Ala Gln Lys Arg Thr  
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Asn Leu Val Asp Val Tyr Gly Asn Met  
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Lys Cys Thr Ala Leu Met Leu Ala Val



1 5

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<400> 86

Lys Ile Gln Cys Leu Glu Lys Ala Thr  
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<210> 87  
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Lys Ile Ala Trp Glu Lys Lys Glu Thr  
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Ile Ala Trp Glu Lys Lys Glu Asp Thr  
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Val Lys Thr Gly Cys Val Ala Arg Val  
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Ala Leu His Tyr Ala Val Tyr Ser Glu  
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&lt;210&gt; 92

&lt;211&gt; 9

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&lt;213&gt; Homo sapiens

&lt;400&gt; 92

Gln Met Lys Lys Lys Phe Cys Val Leu  
1 5

&lt;210&gt; 93

&lt;211&gt; 9

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&lt;213&gt; Homo sapiens

&lt;400&gt; 93

Ala Leu Gln Cys His Gln Glu Ala Cys  
1 5

&lt;210&gt; 94

&lt;211&gt; 9

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&lt;213&gt; Homo sapiens

&lt;400&gt; 94

Ser Glu Gln Ile Val Glu Phe Leu Leu  
1 5

&lt;210&gt; 95

&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 95

Ala Val Ile Glu Val His Asn Lys Ala  
1 5

&lt;210&gt; 96

&lt;211&gt; 9

&lt;212&gt; PRT

&lt;213&gt; Homo sapiens

&lt;400&gt; 96

Ala Val Thr Cys Gly Phe His His Ile  
1 5

&lt;210&gt; 97

&lt;211&gt; 9

<212> PRT  
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<400> 97

Ala Cys Leu Gln Arg Lys Met Asn Val  
 1 5

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<400> 98

Ser Leu Val Glu Gly Thr Ser Asp Lys  
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<210> 99  
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<400> 99

Met Thr Lys Arg Lys Lys Thr Ile Asn Leu Asn Ile Gln Asp Ala Gln  
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Lys Arg Thr Ala Leu His Trp  
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<210> 100  
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 <212> PRT  
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<400> 100

Thr Ser Glu Lys Phe Thr Trp Pro Ala Lys Gly Arg Pro Arg Lys Ile  
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Ala Trp Glu Lys Lys Glu Asp  
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<210> 101  
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<400> 101

Asp Glu Ile Leu Pro Ser Glu Ser Lys Gln Lys Asp Tyr Glu Glu Asn  
 1 5 10 15

Ser Trp Asp Thr Glu Ser Leu  
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Arg Leu Thr Leu Asn Gln Glu Glu Glu Lys Arg Arg Asn Ala Asp Ile  
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Leu Asn Glu Lys Ile Arg Glu  
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<400> 103

Ala Glu Asn Thr Met Leu Thr Ser Lys Leu Lys Glu Lys Gln Asp Lys  
 1 5 10 15

Glu Ile Leu Glu Ala Glu Ile  
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<210> 104  
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<400> 104

Asn Tyr Asn Asn His Leu Lys Asn Arg Ile Tyr Gln Tyr Glu Lys Glu  
 1 5 10 15

Lys Ala Glu Thr Glu Asn Ser  
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<400> 105

Ser Arg Arg His His Cys Arg Ser Lys Ala Lys Arg Ser Arg His His